BATON ROUGE
ORTHOPAEDIC CLINIC

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# PCL Reconstruction Protocol

The intent of this protocol is to provide the clinician with a guideline for the post-operative rehabilitation course of a patient that has undergone a PCL or PCL/ACL reconstruction. It is by no means intended to be a substitute for one's clinical decision-making regarding the progression of a patient's post-operative course based on their exam findings, individual progress, and/or presence of post-operative complications. If a clinician requires assistance in the progression of a post-operative patient, they should consult with the referring surgeon.

## GENERAL GUIDELINES

- No open chain hamstring work.
- Typically it takes 12 weeks for graft to bone healing time.
- Caution against posterior tibial translation (gravity, muscle action).
- Typically no CPM.
- PCL with posterolateral corner or LCL repair follows different post-op care (i.e. crutches x 3 months).
- Resistance for hip PRE's should be placed above the knee for hip abduction and adduction; resistance may be placed distally for hip flexion.
- Supervised physical therapy generally takes place for 3-5 months post-operatively.

## GENERAL PROGRESSION OF ACTIVITIES OF DAILY LIVING

Patients may begin the following activities at the dates indicated, unless otherwise specified by the surgeon:

- Bathing/showering without brace (sponge bath only until suture removal)- 1 week post-op.
- Typically patients can return to driving: 6-8 weeks post-op.
- Typically begin sleeping without brace: 8 weeks post-op.
- Full weight-bearing without assistive devices: 8 weeks post-op (with surgeon's clearance based on structural integrity of repair). The exception is PCL with posterior lateral corner (PLC) or LCL repair, as above.

## REHABILITATION PROGRESSION

### PHASE I: Immediately post-operatively to week 4

**Goals:**

- Protect healing bony and soft tissue structures.
- Minimize the effects of immobilization:
    - Early protected range of motion (protect against posterior tibial sagging).
    - PRE's for quadriceps, hip, and calf with an emphasis on limiting patellofemoral joint compression and posterior tibial translation.
- Patient education for a clear understanding of limitations and expectations of the rehabilitation process, and need for supporting proximal tibia/preventing sag.

**Brace:**

- 0-1 week: post-op brace locked in full extension at all times.
- At 1 week post-op, brace is unlocked for passive ROM performed by a physical therapist or PT assistant.
- Technique for passive ROM is as follows:
    - Patient supine; therapist maintains anterior pressure on proximal tibia as knee is flexed (force on tibia is from posterior to anterior).
    - For patients with combined PCL/ACL reconstructions, the above technique is modified such that a neutral position of the proximal tibia is maintained as the knee is flexed.
    - It is important to prevent posterior sagging at all times.

**Weight-bearing status:**

- Weight-bearing as tolerated (WBAT) with crutches, brace locked in extension.

**Special considerations:**

- Position pillow under proximal posterior tibia at rest to prevent posterior tibial sag.

**Therapeutic exercises:**

- Patellar mobilization.
- Quadriceps sets.
- Straight leg raise (SLR).
- Hip abduction and adduction.
- Ankle pumps.
- Hamstring and calf stretching.

- Calf press with exercise bands, progressing to standing calf raise with full knee extension.
- Standing hip extension from neutral.
- Functional electrical stimulation (as needed for trace to poor quadriceps contraction).

**PHASE II: Post-operative weeks 4 to 12**

**Criteria for progression to Phase II:**
- Good quadriceps control (good quad set, no lag with SLR).
- Approximately 60 degrees knee flexion.
- Full knee extension.
- No signs of active inflammation.

**Goals:**
- Increase ROM (particularly flexion).
- Normalize gait.
- Continue to improve quadriceps strength and hamstring flexibility.

**Brace:**
- 4-6 weeks: Brace unlocked for gait in controlled environment only (i.e. patient may walk with brace unlocked while attending PT or when at home).
- 6-8 weeks: Brace unlocked for all activities.
- 8 weeks: Brace discontinued, as allowed by surgeon.
    - Note, if PCL or LCL repair, continue brace until cleared by surgeon.

**Weight-bearing status:**
- 4-8 weeks: WBAT with crutches.
- 8 weeks: May discontinue crutches if patient demonstrates:
    - No quadriceps lag with SLR.
    - Full knee extension.
    - Knee flexion 90-100 degrees.
    - Normal gait pattern (May use 1 crutch/cane until gait normalized).
- If PLC or LCL repair, continue crutches for 12 weeks.

**Therapeutic Exercises**:
- 4-8 weeks:
    - Wall slides/mini-squats (0-45 degrees).
    - Leg press (0-60 degrees).
    - Standing 4-way hip exercise for flexion, extension, abduction, adduction (from neutral, knee fully extended).
    - Ambulation in pool (work on restoration of normal heel-toe gait pattern in chest-deep water).
- 8-12 weeks:

- Stationary bike (foot placed forward on pedal without use of toe clips to minimize hamstring activity; seat set slightly higher than normal).
- Closed kinetic chain terminal knee extension using resisted band or weight machine. Note: important to place point of resistance to minimize tibial displacement.
- Stairmaster.
- Elliptical trainer.
- Balance and proprioception exercises.
- Seated calf raises.
- Leg press (0-90 degrees).

**PHASE III: Post-operative months 3 to 9**

**Criteria for progression to Phase III:**

- Full, painfree ROM. (Note: it is not unusual for flexion to be lacking 10-15 degrees for up to 5 months post-op.)
- Normal gait.
- Good to normal quadriceps control.
- No patellofemoral complaints.
- Clearance by surgeon to begin more concentrated closed kinetic chain progression.

**Goals:**

- Restore any residual loss of motion that may prevent functional progression.
- Progress functionally and prevent patellofemoral irritation.
- Improve functional strength and proprioception using close kinetic chain exercises.
- Continue to maintain quadriceps strength and hamstring flexibility.

**Therapeutic exercises:**

- Continue closed kinetic chain exercise progression.
- Treadmill walking.
- Jogging in pool with wet vest or belt.
- Swimming (no breaststroke or "frog kick").

**PHASE IV: Post-operative Month 9 until return to full activity**

**Criteria for progression to Phase IV:**

- Clearance by surgeon to resume full or modified/partial activity (i.e. return to work, recreational, or athletic activity).
- No significant patellofemoral or soft tissue irritation.
- Presence of necessary joint ROM, muscle strength and endurance, and proprioception to safely return to athletic participation.
    - Full, painfree ROM.
    - Satisfactory clinical examination.

- Quadriceps strength 85% of uninvolved leg.
- Functional testing 85% of uninvolved leg.
- No change in laxity testing.

**Goals:**

- Safe and gradual return to work or athletic participation.
  - This may involve sport-specific training, work hardening, or job restructuring as needed.
  - Patient demonstrates a clear understanding of their possible limitations.
- Maintenance of strength, endurance, and function.

**Therapeutic exercises:**

- Continue closed kinetic chain exercise progression.
- Cross-country ski machine.
- Sport-specific functional progression, which may include but is not limited to:
  - Slide board.
  - Jog/Run progression.
  - Figure 8, carioca, backward running, cutting.
  - Jumping (plyometrics).
- Work hardening program as indicated by physical therapist and/or surgeon recommendation. Patient will need a referral from surgeon to begin work hardening.

This protocol has been modified from Brotzman and Wilk, which has been published in Brotzman SB, Wilk KE, *Clinical Orthopaedic Rehabilitation*. Philadelphia, PA: Mosby Inc; 2003: 300-302.

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